Claims 36-46 have been rejected under 35 U.S.C. §102(e) as anticipated by Lin et al. U.S. Patent No. 5,590,321 (Lin '321) for reasons stated on pages 4-7 of the Office action. For purposes of expedition, independent claim 36 has been amended to render the rejection moot and to place in condition for allowance. Applicants respectfully submit that the features of independent claim 36 are not taught or suggested by Lin '321. Therefore, Applicants respectfully request the Examiner to reconsider and withdraw this rejection for the following reasons.

Lin, U.S. Patent Number 5,590,321 discloses the use of a query optimizer 120 as shown in FIG. 1 for high performance query optimization in a heterogeneous distributed multi-database system. Such a query optimizer 120 is provided in an interface module 106 which is located between a host computer 104 and a back-end database system 108A-108C for enabling the interface module 106 to perform maximal query or subquery push down. The interface module 106 is configured to select either the entire query or the largest subqueries within the query that can be forwarded to a single database instance within the back-end database system without decomposition or extraneous commands. More specifically, if a query (or subquery) meets following two conditions, the query (or subquery) is pushed down to a single database instance in the heterogeneous environment as shown in FIG. 3.

First, all of the data referenced in the query (or subquery) are located within the single database instance. Second, all the functions needed to satisfy the query (or subquery) are provided by the same single database instance.

In contrast to the distributed multi-database system of Lin '321, Applicants' independent claim 36, as amended, defines a retrieval method about ADT (Abstract Data Type) data in a database system.

In Lin '321, when retrieving data (whether it is ADT data or not), the database system is NOT holding location information which indicates position of the data value. What is held here is the data value itself. More specifically, on lines 3-18, column 7, Lin '321 describes the process of checking whether all of the data referenced in the query (or subquery) are located within a single database instance. However, the checked information of Lin '321 is used for the purpose of determining whether the query (or subquery) can be pushed down to a single database. Such checked information is NOT location information which indicates location (storing position) of (each) data value in a database server as defined in Applicants' claim 36. Certainly, such checked information is NOT used for reading data using the information, when operating data in the manner described in Applicants' claim 36. In addition, the subquery as described by Lin '321 is completely different from ADT attribute data value (partial data, sub data) as defined in Applicants' claim 36.

Clearly, there is no disclosure from Lin '321 of the Applicants' claimed "ADT data including a plurality of attribute values" nor is there any teaching or suggestion from Lin '321 of any "location information which indicates location of said ADT data in said database server" as expressly defined in claim 36 and its dependents.

The rule under 35 U.S.C. §102 is well settled that anticipation requires that each and every element of the claimed invention be disclosed in a single prior art reference. *In re Paulsen*, 30 F.3d 1475, 31 USPQ2d 1671 (Fed. Cir. 1994); *In re Spada*, 911 F.2d 705, 15 USPQ2d 1655 (Fed. Cir. 1990). Those elements must either be inherent or disclosed expressly and must be arranged as in the claim. *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 9 USPQ2d 1913 (Fed. Cir. 1989); *Constant v. Advanced Micro-Devices, Inc.*, 848 F.2d 1560, 7 USPQ2d 1057 (Fed. Cir. 1988); *Verdegall Bros., Inc. v. Union Oil Co.*, 814 F.2d 628, 2 USPQ2d 1051 (Fed.

Cir. 1987). The corollary of that rule is that absence from the reference of any claimed element negates anticipation. *Kloster Speedsteel AB v. Crucible Inc.*, 793 F.2d 1565, 230 USPQ2d 81 (Fed. Cir. 1986).

In the present situation, Lin '321 fails to disclose and suggest Applicants' claims 36-46. Therefore, Applicants respectfully request that the rejection of claims 36-46 be withdrawn.

Dependent claims 47-48 have also been rejected under 35 U.S.C. §103(a) as being unpatentable over Lin et al., U.S. Patent No. 5,590,321 as applied to claim 44 above, and further in view of Lomet, U.S. Patent No. 5,806,065. Since this rejection is predicated upon the correctness of the rejection of claims 36-46 based on Lin et al. U.S. Patent No. 5,590,321 (Lin '321), Applicants respectfully traverse for the same reasons discussed above.

Lastly, claims 49-53 have been rejected under 35 U.S.C. §102(e) as being anticipated by Carino, U.S. Patent No. 5,754,841. The rejection is respectfully traversed, however. Applicants submit that the features of the present invention are not taught or suggested by Carino '841. Therefore, Applicants respectfully request the Examiner to reconsider and withdraw this rejection for the following reasons.

Independent claim 49 defines "[A] database system having a plurality of first servers which operate a database, and which retrieve data from said database; and a second server connected to said first servers, which controls and analyzes queries about said database, including a data retrieval query to retrieve data from selected ones of said first servers, and a sub-data utilization query to retrieve only selected sub-data items from said data retrieved from a database operation." Dependent claims 50-53 further define data retrieved from said database contains sub-data items corresponding to attributes of an Abstract Data Type (ADT) and such

sub-data items can be retrieved based on location information and dictionary information concerning locations of said sub-data items within said data and sub-data identifiers.

In contrast to Applicants' claims 49-53, Carino '841 discloses a database management system as shown in FIGs. 1-2 which provides users and application developers with large object processing and retrieval capabilities within a structured query language (SQL)-based operating environment. A method for parallel execution of user-defined functions for multimedia object data (including ADT object data) in an object-relational database management system is described. A federated coordinator 206 as shown in FIG. 2 is provided between an object server 212 and a RDBMS 210 and utilized for the purpose of parallelizing execution of the function for the object data. The object server 212 has one or more virtual processor instances, which perform each function, and one or more virtual disk instances, which store each object data. The federated coordinator 206 receives client commands comprising a data surrogate identifying the object data and a function for the object data, translates the client commands into object server commands. The function for the object data is performed in parallel by a virtual processor associated with the virtual disk instance storing the object data.

In Carino '841, the database management system is holding location information (MOL, MOID, etc.) of ADT data value (ADT object data) in a database server (object sever 212), but it is NOT referring to the database server, when retrieving the ADT data value with SELECT command. It is referring to the database server (object server 212), when storing the ADT data value with INSERT command.

In addition, the data used for operation is read from the database server (object sever 212) which stores the data, but an operation (function) for ADT object data is moved to a virtual processor in object server which stores the ADT object data in Carino's invention.

These differences are caused by existing the virtual processor storing the function and the virtual disk storing the ADT object data in the same object server in Carino's invention.

In contradistinction, Applicants' claims 49-53 require the second server 12 (i.e., front-end server 12 as shown in FIG. 1) which operates the ADT data (attribute value 129) to differ from the first servers 13 (database operation servers) which store the ADT data value.

Since Carino '841 fails to disclose and suggest Applicants' claims 49-53, Applicants respectfully request that the rejection of claims 49-53 under 35 U.S.C. §102(e) be withdrawn.

In view of the foregoing amendments, arguments and remarks, all claims are deemed to be allowable and this application is believed to be in condition to be passed to issue. Should any questions remain unresolved, the Examiner is requested to telephone Applicants' attorney at the Washington DC area office at (703) 312-6600.

No fees have been incurred. Please charge any shortage in the fees due in connection with the filing of this paper, to Deposit Account No. 01-2135, and please credit any excess fees to such deposit account.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "**Version with markings to show changes made.**"

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Claims 36-44 and 49 have been amended as follows:

36. (Amended) A data processing method in a database system, comprising the steps of:

~~inputting a query including a retrieval part retrieving a database based on a search condition and an operation part operating retrieved data;~~

~~retrieving said database based on said search condition and holding position information of said retrieved data, when processing said retrieving part; and~~

~~referencing said retrieved data used said position information from said database and operating said retrieved data.~~

storing abstract data type (ADT) data including a plurality of attribute values in a database server:

referring to said database server and holding location information which indicates the location of said ADT data stored in said database server, when retrieving said ADT data; and

reading said attribute values using said location information and operating said attribute values, when operating said attribute values contained in said ADT data located by said location information.

37. (Amended) The data processing method according to claim 36, wherein said ~~retrieved~~ ADT data retrieved is constituted by a plurality of partial data, and each said partial data is defined by an attribute value including a name and data type declaration.

38. (Amended) The data processing method according to claim 37, wherein, during operating said ~~retrieved~~ ADT data retrieved, said partial data is extracted from ~~said~~ retrieved ADT data.

39. (Amended) The data processing method according to claim 37, wherein, during operating said ~~retrieved~~ ADT data retrieved, said partial data is stored as part of ~~said~~ retrieved ADT data.

40. (Amended) The data processing method according to claim 37, wherein, during operating said ~~retrieved~~ ADT data retrieved, said partial data of ~~said~~ retrieved ADT data is replaced by another partial data.

41. (Amended) The data processing method according to claim 37, wherein, during operating said ~~retrieved~~ ADT data retrieved, said partial data of ~~said~~ retrieved ADT data is deleted from said retrieved ADT data.

42. (Amended) The data processing method according to claim 37, wherein said ~~operating said retrieved~~ ADT data retrieved is defined by a member function which contains processing for said partial data in definition of ~~said~~ retrieved ADT data.

43. (Amended) A data processing method in a database comprising the steps of:

inputting a query for data retrieval from a database;

retrieving data including a plurality of partial data from said database based on a search condition, and holding position information of retrieved data; and

retrieving said partial data of said retrieved data from said database based on said position information so that any of said partial data in said retrieved data is used for processing, control and database operations subsequent to said data retrieval.

44. (Amended) A database retrieval system comprising:

a first server for analyzing queries about a database; and

a plurality of second servers connected to said first server by a network, for operating ~~a~~ said database,

wherein said second servers retrieve data from said database, and said first server processes and controls data retrieved by said second servers, and

wherein said first server causes said second servers, upon retrieval of data to return position information about said data as a retrieval result to said first server, and retrieves said data from ~~said database operation~~ a second server based on said position information for processing, control and database operations subsequent to the retrieval of said data.

49. (Amended) A database system, comprising:

a plurality of first servers which operate a database, and which retrieve data from said database; and

a second server connected to said first servers, which controls and analyzes queries about said database, including a data retrieval query to retrieve data from selected ones of said first servers, and a sub-data utilization query to retrieve only selected sub-data items from said data retrieved from a database operation.